

From: Helen Croxson [mailto:Helen.Croxson@mcga.gov.uk]
Sent: 08 February 2019 19:38
To: Hornsea Project Three
Cc: Peter Lowson
Subject: Re: Hornsea 3 Offshore Windfarm Project (EN010080-001331)

Hornsea Three Project Team,

Please find attached responses from MCA for deadline 6.

Kind regards

Helen



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Please note I currently work Tuesdays, Wednesdays and Thursdays.

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Our ref: Hornsea 3 Offshore Windfarm
Project (EN010080-001331)

8 February 2019

Dear Sir/Madam

**Application for an Order granting Development Consent for the proposed
Hornsea Project Three Offshore Wind Farm**

**The Examining Authority's Deadline 6 – Responses on Orsted's comments to
representation made by MCA at deadline 4.**

The MCA's remit for offshore renewable energy development is to ensure that safety of navigation is preserved, and our search and rescue capability is maintained, whilst progress is made towards government targets for renewable energy. This includes our obligations under The United Nations Convention on the Law of the Sea.

The MCA would like to comment on the following items:

- 1) In response to the Applicants Appendix 9 to Deadline 5 Submission Summary of Array Layout Position and Responses to Interested Parties;
- 2) Written Questions 2.5 Navigation and Other Offshore Operations; and
- 3) The Draft DCO with regards to hydrographic surveys and Arbitration.

**Appendix 9 to Deadline 5 Submission Summary of Array Layout Position and
Responses to Interested Parties**

Development Principles



HM Coastguard

Paras 1.1– 1.4

The layout is of significant concern for MCA going forward, and the design principles have not yet been fully agreed by MCA. Although we support the establishment of the design principles, we should not be held to account should we not have considered every possible future eventuality based on the information provided within the current design principles. It has been evident during meetings that the design principles can be subject to different interpretation. Therefore, the MCA continues to request the option and ability to consider any layout plans on a case by case basis in line with MGN 543. This includes our strong recommendation that at least two lines of orientation are included within the layout design.

It remains to be seen if the layout principles “*avoid potential delay*” in the approval process, and they have taken considerably more time than more conventional layout conversations. The principles are still not fully agreed and MCA will continue to work with the applicant to resolve these issues. Where actual layouts have been discussed for other developments, rather than principles, it has taken less time and less resources, so the benefit of using these design principles is yet to be seen.

The MCA remains of the opinion that two lines of orientation should be incorporated into the layout plans for Hornsea 3. MGN 543 requires at least two lines of orientation unless it can be demonstrated that fewer is acceptable. Although we note the worst case has been assessed in the NRA, based on just one line of orientation, this does not mean that we should accept one line if more can be achieved by the developers. It is up to the applicant to demonstrate they have made every attempt to achieve a minimum of two lines of orientation, through appropriate justification in support of this reduction to our requirement. Until we receive this justification, and agree it in consultation with Trinity House, we cannot support just one line of orientation at this stage.

Although the NRA suggests lower commercial, recreation and fishing in the area, there is still the risk that vessels may find themselves in the vicinity of the site in poor weather or in an evolving emergency situation. MGN 372 provides guidance to Mariners operating in the vicinity of windfarms. There are three options for mariners: (a) Avoid the OREI area completely, (b) Navigate around the edge of the OREI, or (c) In the case of a wind farm, navigate, with caution, through the wind farm array. Two lines of orientation will ease navigation, and when considering the cumulative effect of multiple windfarms in the North Sea in the future, windfarms with a consistent grid layout will be safer and easier to navigate.

We also note Trinity House’s submission dated 23rd Jan 2019 (regarding further written questions at deadline 5), a key navigation safety stakeholder who has provided a detailed response in support of the two lines of orientation.

Hornsea Project Three SAR aspects

1.5 Mark Prior is the second specialist which the Applicant has engaged with regarding Hornsea 3, and others on separate projects. While the MCA encourages this engagement and welcomes the additional expertise Mark brings to discussions, the MCA has undertaken repeated conversations covering the same ground with different individuals.

1.5.1 As detailed in the “MCA report on renewables SAR trials” document, paper calculations (contained in 15 Aug meeting SAR follow-up v1.2) do not appear to have accounted for wind conditions or safety margins to turbines. When wind conditions are accounted for, particularly in higher values which may well be encountered during an incident, the turning radii is increased significantly. In a 40kt wind, a 30° angle of bank turn at 80 kts could result in a turning radius of up to 1km depending on wind direction. 150m of a safety margin is required for each turbine therefore 300m need to be added on. This is already in excess of 1km and for greater windspeed, or a reduced angle of bank turn (e.g. 20°) is conducted, the required space increases.

In addition, all the crews which the MCA has liaised with are cautious about any required turning within a windfarm, particularly at night and/or in reduced visibility or strong wind conditions.

AIS transmitters on key turbines may assist in indicating a HRA, however, it does not completely mitigate the requirements to safely turn within these areas. Furthermore, any restriction on space or lack of straight-line corridors may not completely result in an area which a SAR helicopter could not access, however, it would significantly increase the time taken to conduct a search and/or rescue. Potentially even to the point when it becomes an ineffective resource.

1.5.2 This has been discussed multiple times previously, and the systems are mentioned in the “MCA report on renewables SAR trials” document. The closest a SAR helicopter would get to a turbine (row of turbines) would be 150m (safety margin). This is approaching the uncorrected visual sweep width for a person in the water (0.1nm/185m) not including corrections for variables such as weather. Add a 300m development corridor, plus blade overfly, and it is greater than this sweep width. The aircraft is fitted with cameras and systems to assist in detection, particularly if a person is wearing detection aids or is carrying emergency beacons. However, the cameras are degraded in moisture and are ineffective in fog.

1.5.3 Two lines of orientation are a preference however we would only accept less on the basis of a valid safety case. A single line of orientation would allow safe access in certain conditions although does not allow for alternative access routes based on variables such as wind direction and if searching, factors such as transiting towards the sun.

1.7/1.8 – The applicant states *‘It is also noted that the MCA has not provided its own technical evidence to the Applicant to support the MCA’s position including outputs of trials that have been undertaken. Consequently, the Applicant has not been able to respond’*. There had been delays in finalising the document summarising SAR exercises and trials, but this is now available. Further technical evidence is supplied in this response.

The applicant states *‘Furthermore, the Applicant has requested to meet (in an official capacity as part of the Examination process) with the MCA’s helicopter service provider; however, MCA states this has not been possible because the helicopter operator of the MCA’s SAR contract may change sometime in the future’*. This is not correct. The MCA arranged for the Applicant’s previous SAR expert to meet with the

helicopter operator on 2 November 2017. The SAR document which was submitted as part of the NRA came about in part due to this, and other meetings with the Applicant, including on the 6 October and 7 November 2017. The Applicant document, which was then commented on in detail by the MCA, has not been finalised by the Applicant and the MCA are still waiting on a response to feedback, provided to the Applicant on 21 February 2018. The MCA is not prepared to continually arrange for different representatives from the Applicant to meet with the helicopter operator, when MCA procedures and policy contained in MGN 543 have already been agreed with the helicopter operator.

The applicant states *'In the absence of an evidenced position from the MCA the Applicant has been constrained in how much progress it has been able to make on this matter'*. An MCA summary of the trials has now been released, however, there were also significant discussions previously, as above, arranged to better inform the Applicant on SAR requirements. These discussions resulted in a recognition of the problems which can be faced by SAR when operating within or in the vicinity of windfarms and this was acknowledged by the Applicant's previous SAR expert.

1.10 – last bullet. The MCA recognises the vast experience Mark Prior has with aviation operations and as previously stated, welcomes his input into discussions on SAR requirements. It is not clear if he has search planning experience, which is a key element which requires consideration when assessing layouts. It must be stressed that lines of orientation are requested for multiple SAR reasons. Safe access may be achieved with one line depending on the conditions. One line of orientation is limiting if there are unfavourable conditions such as cross winds, and it does not lend itself to efficient search options, particularly in reduced visibility. Searching a windfarm, by any resource (marine or air) is going to be challenging with any layout but reducing the available options by limiting lines of orientation will add additional complication.

1.11 A single line of orientation was a positive improvement after the initial layout discussions with the Applicant which were, quite frankly, completely unacceptable. The principles were also considered as a sensible approach, however, they have proven to be extremely time consuming with several meetings required to discuss them plus considerable resource from the MCA to provide feedback. They are also still not resolved with all parties failing to agree on certain principles.

1.14 The MCA has not moved away from initial requirements, merely highlighting the multipurpose requirement for the HRA. The HRA still allows for access to and egress from a windfarm, other than via a single line of orientation or where spacing is limited with multiple lines of orientation (not the case with Hornsea 3).

1.16 The MCA has countered the 1km spacing of a HRA, repeatedly, during meetings and submissions. This is also now included in the "MCA report on renewables SAR trials" document with further detail provided in this reply.

1.17 The MCA has agreed with the Applicant that the addition of AIS transponders, switched on if required, may well provide additional mitigation for SAR aircraft operating in the area. However, they do not mean a decrease in width is suitable, since an aircraft may still be required to turn within that area. The MCA welcome the

suggestion of using AIS in this capacity and it shows the benefit of having open and frank conversation.

1.18 The MCA does not see how the SAR lanes would allow SAR access in all weather conditions. The MCA has also responded to points raised about the sensors on aircraft and the limitations caused by moisture. There may also be limitations depending on the type of object the aircraft is searching for, and any limitations created by searching through any windfarm.

1.19/1.20/1.21 – The tender for the SAR helicopter provision was not written for operations within windfarms. In addition, not all requirements were fully met and the aircraft are fitted with a weather radar.

2.1 – disagree as covered above

2.3 – The MCA notes the upcoming ISH8 on the Search and Rescue aspects. Unfortunately, it is unlikely that the MCA representative with the relevant expertise in this field will be able to attend the hearing on this occasion. This is something the MCA would have certainly supported had the hearing been scheduled for a different date.

Applicants Comments on Interested Parties Responses to the ExA Second Written Questions

1.5 Written Questions 2.5 Navigation and Other Offshore Operations

Reference to MCA response at deadline 4:

The Applicant notes that a submission relating to MCA's intent to comment on the dDCO has not yet been made and would ask that this is made as soon as possible so that the MCA's views may be reviewed and responded to.

See MCA response below.

Reference to Q2.5.7 The Applicant would like clarification from the MCA on what is the purpose of the HRA?

The MCA wishes to remind the Applicant of MGN 543 Annex 5, section 9.26.3 which states: Helicopter refuge areas are to allow SAR helicopters access to a defined area of safe airspace to: manoeuvre in preparation to enter or when exiting wind farms, to safely turn within a windfarm or, in the event of an emergency requiring the helicopter to escape from the wind farm.

Each HRA is assessed on a case by case basis as layouts may be complex and depending on the number of lines of orientation, spacing, length of lanes and other variables, the requirements and details for a HRA will change.

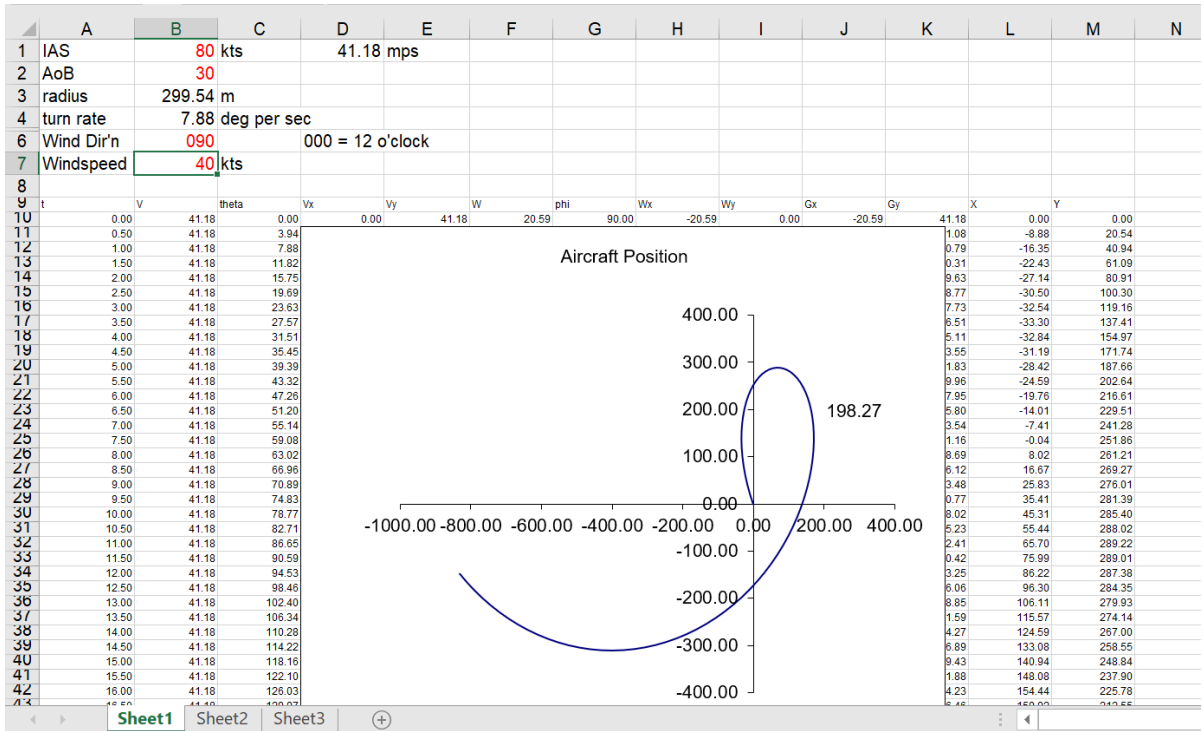
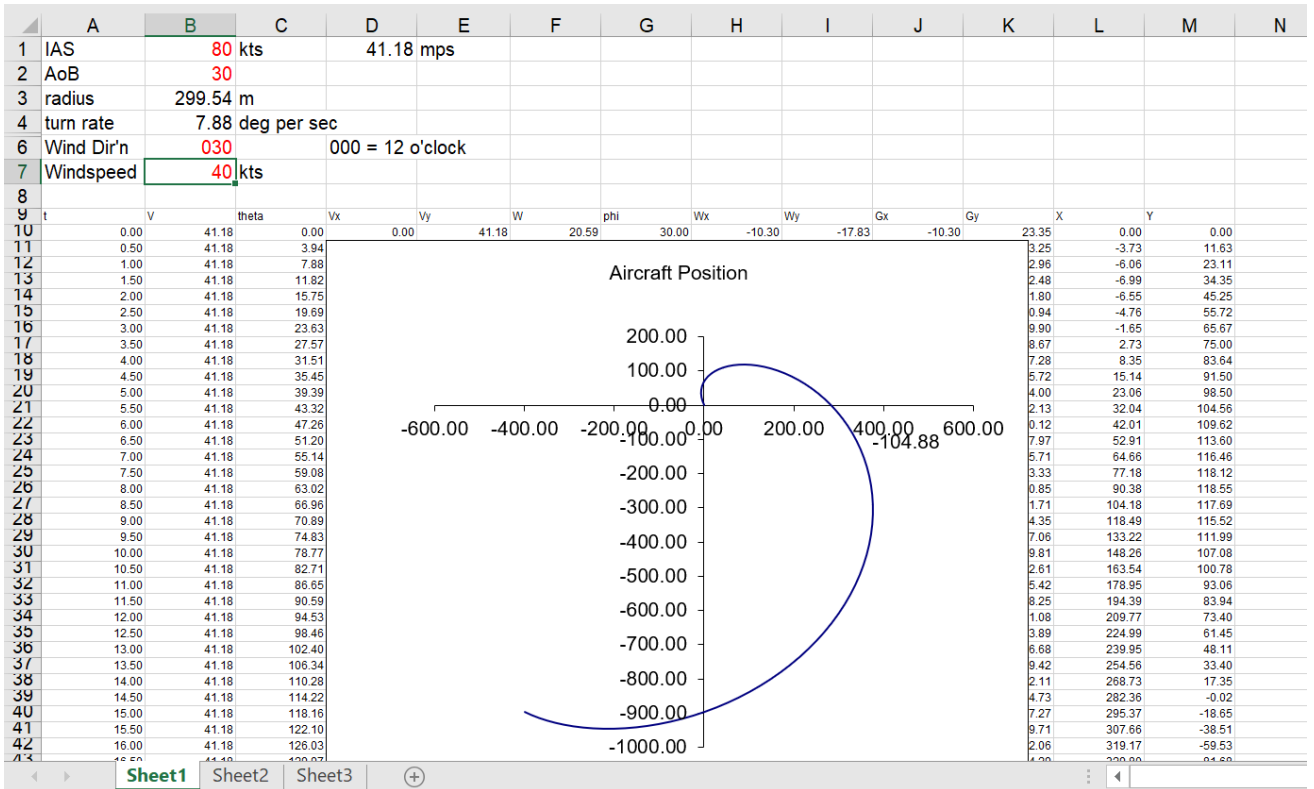
Further information is contained with the document "MCA report following aviation trials and exercises in relation to offshore windfarms", specifically:

Where assessed as being required, refuge areas provide a number of benefits for a SAR aircraft. A refuge area is designed for sufficient space which may allow the crew to re-orientate themselves and to turn into before entering another SAR lane e.g. during a search. It may allow an aircraft to enter a windfarm from part way along, at perpendicular angles, rather than transiting down a whole lane e.g. to access a single turbine, saving time and reducing risk. The lane also provides a safe/clear area of airspace/waterspace which the SAR aircraft may be able to navigate to during an aircraft emergency or to winch from a vessel, if this is deemed to be preferred.

Reference to Q2.5.7 The Applicant would like to confirm whether the MCA agree that the Applicants technical evidence demonstrates that the helicopter can turn within 1km, if not, please can that evidence be provided?

As detailed in the “MCA report on renewables SAR trials” document, paper calculations (contained in 15 Aug meeting SAR follow-up v1.2) do not appear to have accounted for wind conditions or safety margins to turbines. When wind conditions are accounted for, particularly in higher values which may well be encountered during an incident, the turning radii is increased significantly. In a 40kt wind, a 30° angle of bank turn at 80 kts could result in a turning radius of up to 1km depending on wind direction. 150m of a safety margin is required for each turbine therefore 300m need to be added on. This is already in excess of 1km and should the windspeed increase, or a 20° angle of bank turn is conducted, the required space increases.

Also attached are two screenshots from a spreadsheet which calculates turning radius, created by a crewman working for the SAR helicopter provider. The MCA are not prepared to share this electronically but happy to show it to the Applicant if they want to discuss it further.



Q2.5.1 MCA. The MCA stands by its response at deadline 4 regarding the need for two lines of orientation for the safety of navigation and search and rescue purposes, as supported by Trinity House's submission dated 23rd Jan 2019.

Q2.5.6 and 2.5.7 No further comments to MCA's our previous responses at this stage.

Draft Development Consent Officer

Article 13 and 14 Pre-construction Plans

The MCA requirements for hydrographic surveys are detailed in section 6 of MGN 543 and in the guidelines for Offshore Developers, including the post construction guidelines. These can be found at the bottom of the following link: <https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping>

On the understanding that these guidelines are followed, we would have no concerns. If possible, the MCA would also like to be involved in the determination of the 'pre-established periodicity' when this is decided. We would therefore suggest the DCO refers to:

Pre-Construction requirements: The undertaker must conduct a swath bathymetric survey to IHO Order 1a of the site and its immediate environs extending to 500m outside of the authorised project area. The survey shall include all proposed cable routes.

This should fulfil the requirements of MGN 543 and its supporting 'Hydrographic Guidelines for Offshore Developers', which includes the requirement for the full density data and reports to be delivered to the MCA and the UKHO for the update of nautical charts and publications. This must be submitted as soon as possible, and no later than [three months] prior to construction. The Report of survey must also be sent to the MMO.

Post-construction requirements: The undertaker must conduct a swath bathymetric survey to IHO Order 1a of the installed export cable route and provide the data and survey report(s) to the MCA and UKHO. The MMO should be notified once this has been done, with a copy of the Report of Survey also sent to the MMO, as per above guidelines.

Article 15 and Article 16 - Offshore safety management

The wording for the condition in the DCO regarding the Emergency Response Cooperation Plan/SAR Checklist is still under discussion with the applicant, and MCA will submit our requested amendments to these articles shortly.

Article 36 Arbitration

The MCA supports the Arbitration concerns raised by the Marine Management Organisation for the reasons set out in their written summary of ISH3.

We hope the Examining Authority find this information useful as part of its considerations for the Hornsea 3 development. Please also find attached the MCA's report on renewables SAR trials, as referenced throughout this response.

Yours faithfully,

Helen Croxson
OREI Advisor
Maritime and Coastguard Agency

Pete Lowson
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Maritime and Coastguard Agency